REMARKS/ARGUMENTS

Claims 1-17 are pending in this application.

Claims 1-6 were rejected under 35 U.S.C. § 102(b) as being anticipated by Bernier et al. (U.S. 6,069,023). Claims 1, 7 and 8 were rejected under 35 U.S.C. § 102(e) as being anticipated by Utagikar et al. (U.S. 6,583,513). Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Utagikar et al. In view of the remark. Claims 11, 12, 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernier et al. in view of the remark. Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernier et al. in view of Chen et al. (US 2003/0150595. Claims 14 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernier et al. in view of Alcoe et al. (U.S. 6,570,259). Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernier et al. in view of Shaw et al. (U.S. 5,330,701). Applicants note that claim 18 was been canceled in the Amendment filed on January 14, 2005. Thus, it appears that the Examiner inadvertently included claim 18 in the rejection over Bernier et al. in view of Alcoe et al. Applicants respectfully traverse the rejections of claims 1-17.

Claim 1 recites:

> "An integrated circuit package comprising:
> a substrate having first and second surfaces and a plurality of conductive traces therebetween;
> a semiconductor die flip-chip mounted to said first surface of said substrate and electrically connected to ones of said conductive traces;
> **an intermetallic heat spreader fixed to a back side of said semiconductor die**; and
> a plurality of contact balls disposed on said second surface of said substrate, in the form of a ball grid array, ones of said contact balls of said ball grid array being electrically connected with ones of said conductive traces." (emphasis added)

Applicants' claim 16 recites features that are similar to the features recited in

Applicants' claim 1, including the above-emphasized feature.

In the Advisory Action mailed on June 24, 2005, the Examiner merely indicated that "examiner still consider[s] aluminum alloy or metal alloy taught by Bernier and Utagikar is equivalent to intermetallic." The Examiner failed to specifically respond to **any** of the arguments set forth in the Request for Reconsideration filed on June 8, 2005, or to explain how, in spite of Applicants' explanation of the differences between an intermetallic and an alloy, the aluminum alloy or metal alloy taught by Bernier and Utagikar could possibly be considered to be an intermetallic.

Accordingly, Applicants respectfully request that the Examiner clearly and specifically respond to each and every argument presented in the Request for Reconsideration filed on June 8, 2005, and repeated herein.

In the Response to Arguments section on pages 4 and 5 of the outstanding Office Action, the Examiner alleged that "Bernier [et al.] teaches in claim 36 (col. 15, lines 34-36) that 'selecting an aluminum alloy for the heat sink' and Utagikar teaches 'the lid 144 is made of a metal or metal alloy and serves to conduct heat away from the integrated circuit' (col. 6, lines 29-31). Also, an intermetallic material is clearly a metal alloy that [is] composed of two or more metals or of a metal and a nonmetal. Therefore, for the above reasons, it is believed that the rejection should be sustained." Applicants respectfully disagree.

Contrary to the Examiner's allegations, the disclosure of an aluminum alloy or a metal alloy, as allegedly taught by Bernier et al. and Utagikar et al., for the heat sink is not equivalent to the incorporation of an intermetallic into the integrated circuit package. While an intermetallic may be an alloy, it is not the case that an alloy is necessarily an intermetallic. In fact, the vast majority of alloys are **not** intermetallics. For example, a NiAl alloy can and does form a metal alloy that does not include any intermetallic compounds. Thus, the mere reference to the use of an alloy does **not** infer or necessitate the use of an intermetallic compound.

Nickel dissolves some aluminum which results in a nickel alloy that does not include any intermetallic compound (NiAl alloy). However, the addition of very large amounts of aluminum to nickel to the point that aluminum is no longer soluble in nickel can result in the formation of an intermetallic compound or a series of intermetallic compounds. These compounds have specific atomic formulas, each with a fixed or narrow range of chemical composition and are stoichiometric combinations of metallic ions that form bonded matrices of compounds. The aluminum dissolved in the nickel does not result in such a narrow range or fixed chemical composition, and thus, the alloy with aluminum dissolved in the nickel covers a wide range of compositions and is not limited to a fixed or narrow range of chemical composition, as is the case for intermetallic compounds. Thus, the terms alloy and intermetallic compound are not identical and cannot be used interchangeably.

Neither Bernier et al. nor Utagikar et al. teaches or suggests the use of any intermetallic, let alone "an intermetallic heat spreader", as recited in Applicants' claims 1 and 16. Since Bernier et al. and Utagikar et al. fail to teach or suggest the use of any intermetallic compound, and instead, merely teach the use of an alloy, Applicants respectfully submit that Bernier et al. and Utagikar et al. cannot possibly anticipate the claims of the present application.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of claim 1 under 35 U.S.C. §§ 102(b) and 102(e) over Bernier et al. and Utagikar et al., respectively, and the rejection of claim 16 under 35 U.S.C. § 103(a) over Bernier et al. taken alone.

The Examiner relied upon Chen et al., Alcoe et al. and Shaw et al. to allegedly cure various deficiencies of Bernier et al. However, Chen et al., Alcoe et al. and Shaw et al. fail to teach or suggest the feature of "an intermetallic heat spreader." Thus, Applicants respectfully submit that Chen et al., Alcoe et al. and Shaw et al. fail to cure the deficiencies of Bernier et al. described above.

Accordingly, Applicants respectfully submit that Bernier et al., Utagikar et al., Shaw et al., Chen et al. and Alcoe et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in Applicants' claims 1 and 16.

In view of the foregoing amendments and remarks, Applicants respectfully submit that Claims 1 and 16 are allowable. Claims 2-15 and 17 depend upon claims 1 and 16, and are therefore allowable for at least the reasons that claims 1 and 16 are allowable.

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

To the extent necessary, Applicants petition the Commissioner for a One-month extension of time, extending to July 8, 2005, the period for response to the Office Action dated March 8, 2005.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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